Please replace the paragraph at page 7, lines 3 through 5 with the following paragraph.

Figure 5 is a graph showing the mass deposited in the lungs relative to the nominal dose (diamonds). The average deposition for the 10 individuals was 59% (dotted line).

Please replace the paragraph at page 30, lines 11 through 21 with the following paragraph.

A Niro Atomizer Portable Spray Dryer (Niro, Inc., Columbus, MD) was used to produce the dry powders. Compressed air with variable pressure (1 to 5 bar) ran a rotary atomizer (2,000 to 30,000 rpm) located above the dryer. Liquid feed with varying rate (20 to 66 ml/min) was pumped continuously by an electronic metering pump (LMI, model #A151-192s) to the atomizer. Both the inlet and outlet temperatures were measured. The inlet temperature was controlled manually; it could be varied between 100°C and 400°C and was established at 100, 110, 150, 175, or 200°C, with a limit of control of 5°C. The outlet temperature was determined by the inlet temperature and such factors as the gas and liquid feed rates: it varied between 50°C and 130°C. A container was tightly attached to the cyclone for collecting the powder product.

Please replace the paragraph at page 30, lines 23 through 24 with the following paragraph.

The geometric diameter and tap density of the three powders are shown in Table 1.

Please replace the paragraph at page 31, lines 13 through 22 with the following paragraph.

Figure 1 shows the results of this experiment. Applicants have demonstrated that at high pressure, about greater than 2 bars and especially about 3 to 4 bars, all three powders exit the disperser as primary (deaggregated) particles. This supports the finding that a relatively high energy successfully deaggregates all three powders. However at pressures below 2 bars, the micronized powder [Powder 1] exited the orifice in an aggregated state. Evidence of this can be seen by a mean particle size leaving the orifice that was greater than the powder's primary particle size. This was not the case for the spray dried powders [Powders 2 and 3], which emitted from the orifice at approximately their primary particles' size. Powders 2 and 3 were highly dispersible powders.

Please replace the paragraph at page 32, line 21 through page 33, line 3 with the following paragraph.

Using these techniques, the inventors compared the primary size from the dry powder disperser at 4 bar to the emitted size from the AIR inhaler at 30 L/min (Figure 2A). As can be seen, the spray dried hGH and spray dried albuterol sulfate emitted particle size was almost identical to their measured primary particle size, which is not the case for the micronized albuterol sulfate. Finally, the inventors also measured primary and emitted aerodynamic size for the spray dried albuterol sulfate and compared it to the micronized albuterol sulfate (Figure 2B). Again, the spray dried albuterol sulfate emitted with a nearly identical aerodynamic diameter as its primary particles' aerodynamic diameter while the micronized albuterol sulfate emitted with a much larger aerodynamic diameter than its primary particles' aerodynamic diameter. This further confirms that the spray dried powders of the present invention disperse into respirable particles while the micronized drug remains nonrespirable even though its primary size is respirable.

Please replace the paragraph at page 35, lines 16 through 24 with the following paragraph.

a6

The placebo powder, comprised of 70/20/10 %w/w DPPC/Sodium Citrate/Calcium Chloride, which was used had the following characteristics: Dg= 6.7um; ρ=0.06 g/cc; Da= 1.6um. The primary aerodynamic particle size characteristics were obtained using time-of-flight (AeroSizer/AeroDisperser) and the geometric particle size characteristics using laser diffraction (RODOS/HELOS) operated at 1 and 2 bar. Emitted aerodynamic particle size characteristics were obtained using Andersen cascade impaction (gravimetric analysis) operated at 28.3 L/min, for a total air volume of 2 L. Geometric particle size characteristics were obtained using laser diffraction (IHA/HELOS, Sympatec, NJ) operated at 60 L/min.

Please replace the paragraph at page 35, line 26 through page 36, line 5 with the following paragraph.

a7

Placebo powder was filled in a reservoir which was closed by an 0.2 μm filter. A ^{99m}Tc solution (0.5 ml ^{99m}Tc in isotonic saline added to 100 ml of deionized water) was filled in a Pari Jet nebulizer which was placed in a drying chamber. The Pari Jet nebulizer was activated for 3 min to nebulize 1.5 ml of the ^{99m}Tc solution. The particles were dried in this chamber and led through the reservoir containing the powder. The humidity in the labelling chamber was controlled and never exceeded 30% relative humidity.

Please replace the paragraph at page 36, lines 6 through 9 with the following paragraph.

a8

Because of the short half life of the ^{99m}Tc, the labelling was performed 2 – 4 hours before the inhalation. The activity of the powder was corrected for the physical decay of the Technetium, to get the actual activity which was available at the beginning of the inhalation.

Please replace the paragraph at page 36, lines 10 through 12 with the following paragraph.

a9 The emitted aerodynamic particle size distribution of the post-labeled powder was obtained using an 8-stage Andersen cascade impactor (gravimetric analysis) to verify that the radiolabeling process did not affect the particle size distribution.

Please replace the paragraph at page 36, lines 13 through 16 with the following paragraph.

a10 Size 2 capsules were hand filled with 5(±1) mg of the radiolabeled powder. Each capsule was numbered and its filled weight and level of radioactivity were recorded. The subject took a capsule and placed it in the inhaler/spirometer device immediately prior to use.

Please replace the paragraph at page 37, lines 1 through 6 with the following paragraph.

a11 These 4 ROIs were copied to the gamma camera image of the powder inhalation. In a region outside of the subject's lung, the background activity was defined and subtracted pixel by pixel from the entire image. Then the number of counts was determined for the 4 ROIs. These numbers were corrected by an attenuation factor for the single regions. After this correction, the relative amount of intrathoracic versus extrathoracic particle deposition was determined.

Please replace the paragraph at page 37, lines 7 through 18 with the following paragraph.

a12 Equivalence between the mass and gamma radiation particle size distributions was obtained, as shown in Figure 4. Approximately 5 mg of powder was loaded into size 2 capsules. The capsules were placed into a breath activated inhaler under development by the applicant (AIR inhaler) and then the inhaler was actuated. Ten healthy subjects inhaled through an inhaler at an approximately inspiratory flow rate of 60 L/min. (The actual inspiratory flow rate varied from subject to subject over a range of 20 to 90 L/min., consistent with the normal range of